

HARDMASK/BARRIER LAYER FOR DRY ETCHING CHROME FILMS AND IMPROVING POST DEVELOP RESIST PROFILES ON PHOTOMASKS

Abstract of the Disclosure

A process for manufacturing and a photomask including a chrome layer over a transparent substrate, followed by a thin hardmask/barrier layer directly over the chrome layer having a thin resist layer thereover. The thin resist layer is patterned and developed wherein the barrier layer acts to retard the formation of a resist "foot" at the bottom of the resist profile. Exposed portions of the hardmask/barrier layer and the underlying chrome layer are etched, and then any remaining hardmask/barrier layer and resist layer is subsequently removed by an etchant. The hardmask/barrier layer directly over the chrome layer enables an improved pattern transfer mask during chrome etching processes, allows for further reduction in the thickness of the resist layer, improves the image quality, the achievable minimum resolution features, and provides nominal image size control and image size uniformity across the photomask within current process flows and manufacturing.

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